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ANTS OF THE AUSTRALIAN GENUS *MESOSTRUMA* BROWN
(HYMENOPTERA: FORMICIDAE)

By ROBERT W. TAYLOR

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Abstract

Mesostruma is redefined and reviewed. Six species are recognised:—*M. browni* Taylor, *M. eccentrica* sp. n., *M. exolympica* sp. n., *M. laevigata* Brown, *M. loweryi* sp. n., and *M. turneri* (Forel). *Epopostruma monstrosa* Viehmeyer, previously assigned to *Mesostruma*, is reassigned to *Epopostruma* as an unrecognisable species, its holotype being so damaged.

INTRODUCTION

The endemic Australian dacetine ant genus *Mesostruma* Brown, 1945, was first revised by W. L. Brown Jr. in 1952. Two species were recognised: *M. turneri* (Forel) (Mackay district, Queensland) and *M. laevigata* Brown (Sea Lake, Victoria). At the same time Brown tentatively transferred the enigmatic species *Epopostruma monstrosa* Viehmeyer (Trial Bay, New South Wales) to *Mesostruma*, though commenting that its original description was hopelessly inadequate. An additional species, *M. browni* Taylor, with type locality near Berry, New South Wales, was later added to the genus (Taylor 1962).

Three further new species are described below from material collected in southeastern Australia during recent years, and *Epopostruma monstrosa* is re-assigned to its original genus.

Although the tally of recognised species has doubled since 1962 *Mesostruma* is obviously still poorly known. Two species, *M. turneri* and *M. loweryi* sp. n., have been collected only once; *M. browni* is known from several scattered localities in eastern New South Wales; *M. laevigata* and especially *M. eccentrica* sp. n. apparently range widely in the Mallee districts of southeastern New South Wales, Victoria and South Australia; and *M. exolympica* sp. n. is known only from two widely separated areas, the Australian Capital Territory near Canberra, and the Mt. Lofty Ranges near Adelaide.

All adequately documented samples are from dry sclerophyll woodland or forest and the several available colony series were taken from the soil under or between stones. Most records are from Berlese funnel samples of leaf-litter and surface soil or sand.

This study attempts to exemplify the taxonomic procedures advocated by Taylor and Beaton (1970). It aims simply to name and diagnose the known species of *Mesostruma*, and to do this in the most succinct and orderly manner possible. It is not presented as a general systematic review in the broad sense. Such a study would not be possible using the uncomprehensive collections and data now available. The paper depends greatly on scanning electron micrographs for portrayal of specific characters, with verbal descriptions reduced to minimal diagnoses. Its general approach, though more mechanical than usual, is entirely adequate for the formal requirements of nomenclatorial taxonomy and species identification, and I consider the results more accessible and effective than would have been possible using conventional procedures. Application of the scanning electron microscope should allow a major procedural breakthrough for descriptive taxonomy of ants and insects of many other groups.

*Division of Entomology, CSIRO, Canberra City, A.C.T. 2601.

Although a scanning electron microscope was essential for production of the illustrations, access to one is not necessary for those using the paper, because all characters employed are visible by optical stereomicroscopy.

The micrographs were prepared with a J.E.O.L. JSM-U3 Scanning Microscope, using gold-palladium coated specimens. I wish to thank Mr. C. D. Beaton for his patient and expert assistance in their preparation.

The following abbreviations are used below for the institutions noted: AM—Australian Museum, Sydney; ANIC—Australian National Insect Collection, CSIRO, Canberra; BM(NH)—British Museum (Natural History), London, U.K.; GM—Museum d'Histoire Naturelle, Geneva, Switzerland; MCZ—Museum of Comparative Zoology, Harvard University, Cambridge, Mass., U.S.A.; NMV—National Museum of Victoria, Melbourne; QM—Queensland Museum, Brisbane; SAM—South Australian Museum, Adelaide; MNB—Museum für Naturkunde, Humboldt University of Berlin, D.D.R.

In the text below the following collectors are indicated by their initials: R.J. Bartell (RJB); C. G. Brooks (CGB); B. B. Lowery (BBL); Janet Simmons (JMS); Claire Taplin (ICT); R. W. Taylor (RWT).

A NOTE ON *Epopostruma monstrosa* VIEHMEYER

Epopostruma monstrosa Viehmeyer, 1925, *Ent. Mitt.* **14**: 30, female. Type locality: Trial Bay (New South Wales).

?*Mesostruma monstrosa* Brown, 1948, *Trans. Am. ent. Soc.* **74**: 119; 1952, *Trans. R. Soc. S. Aust.* **75**: 13.

Dr E. Königsmann has kindly provided the holotype of *E. monstrosa* (MNB collection) for this study. The specimen is fragmentary, consisting of the postpetiole, gaster and three legs, glued separately to a small card. Judging from the postpetiolar structure *monstrosa* should be reassigned to *Epopostruma*. However these fragments cannot provide a satisfactory paradigm for the species which must be considered formally unrecognisable. The Directors of the Museum für Naturkunde have generously agreed to retention of the *monstrosa* holotype in the Australian National Insect Collection.

Genus *Mesostruma* Brown

Mesostruma Brown, 1948, *Trans. Am. ent. Soc.* **74**: 118-119; 1952, *Trans. R. Soc. S. Aust.* **75**: 9.

Diagnosis

This diagnosis is based on that of Brown (1952) modified to accommodate all species now known.

Subfamily Myrmicinae, tribe Dacetini.

Worker.—Mandibles elongate-triangular, their external borders feebly concave; apex of each with a stout acute apical tooth and a subequal or smaller subapical one; space between shaft proper and line of closure filled with a semi-transparent lamina.* This lamina with cultrate edentate mesial and straight basal margins meeting at the apex of an oblique basal tooth, which extends from the shaft and is entirely enclosed in the lamina, though visible through it. Labrum broad, tongue-shaped. Palpal formula 5:3. Antennae 6-segmented, funicular proportions as in *Epopostruma*. Head moderately inflated behind; occipital border concave. Eyes dorsolaterally placed, moderately large. Thoracic profile usually evenly convex, sometimes strongly so; the outline in several species shallowly indented by a transverse metanotal groove, which does not carry a sharply incised suture. Pronotum with or, more usually, without subdentiform humeri; mesonotum unarmed; propodeal declivity bordered laterally by broad semi-transparent lamellae, or, in one species, with a pair of posterodorsal spines above and small posteroventral lamellae below.

*A structure not apparent in the plates to this paper, because the illustrated specimens were opaquely coated for scanning electron microscopy. See Brown (1952, fig. 1A).

Petiole with well developed sub-globular node, unarmed laterally, though the anterodorsal corners may be obtusely angulate. Postpetiole usually transverse, with broad flat wing-like lateral lamellate expansions, which are thick anteriorly and taper posteriorly. In one species the postpetiole is sub-globose, with at most only vestiges of lateral ornamentation. Gaster large, almost as deep as wide.

Sculpture of head, thorax and nodes consisting of broad spaced circular foveolae, each bearing a median hair; intermediate surfaces smooth or with microsculpture. Gaster usually smooth and shining, its first tergite often with a few short coarse basal ribs, or, in one species, very finely longitudinally sculptured. Colour brown, ranging from dull ferruginous to rich yellowish-sienna.

Female.—Known for the following species: *browni*, *eccentrica*, *exolympia* and *laevigata*. Diagnostic features as in worker; distinguished from females of related dacetine genera by mandibular, antennal, petiolar and postpetiolar characters. All available specimens are dealate and have complete thoracic structure.

Male.—Known only for *M. browni*, described by Taylor (1962, p. 4, figs. 3-5). The present dearth of knowledge about males of this and other dacetine genera precludes generic level diagnosis.

Larva.—Larvae of *browni* and *exolympia* are in the ANIC. Those of *laevigata* were described by G. C. and J. Wheeler (1954, p. 130; Plate 9, figs. 1-3).

Type species.—*Strumigenys (Epopostruma) turneri* Forel, 1895, designated by Brown, 1948.

RELATIONSHIPS

Mesostruma was placed by Brown (1952) in the subtribe Epopostrumiti of tribe Dacetini, along with the African *Microdaceton* Santschi and the Australian *Epopostruma* Forel (= *Hexadaceton* Brown) and *Colobostruma* Wheeler (= *Alistruma* Brown, = *Clarkistruma* Brown). These genera can be arranged in a morphological series running from *Epopostruma* (with *Microdaceton*) through *Mesostruma* to *Colobostruma*, and this morphocline can be interpreted as reflecting an evolutionary line in which elongation of the head, shortening and triangularisation of the mandibles and development of aliform structures on the petiole and postpetiole have occurred. *Epopostruma* somewhat resembles the Australian genus *Orectognathus* Fr. Smith and the possibly synonymous New Guinean *Arnoldidris* Brown (subtribe Orectognathiti), which in turn show affinity to the apparently primitive Neotropical genera *Daceton* Perty and *Acanthognathus* Mayr (subtribe Dacetiti) (Brown 1952; Brown and Wilson 1959).

CHARACTERS USED FOR SPECIES DISCRIMINATION

The specific diagnoses to follow are reduced to the minimum necessary for identification of all specimens now available, taking into account the variations observed. Further characterisation is left to the scanning electron micrographs.

In attempting to identify new specimens the reader should first obtain an *hypothesis of identity* of his material, using the key to species. This hypothesis should then be tested by consulting the relevant diagnosis, and further examined by comparing the specimens with the appropriate illustrations. The procedure here will not be unfamiliar, except that the final identification check is made primarily by comparing the specimens with a set of illustrations, rather than by matching them with a verbal characterisation.

The following list provides a guide to features which should be considered when comparing specimens with micrographs:

1. Shape and proportions of head, especially its lateral and occipital outline behind the eyes.
2. Relative size and convexity of the eyes.
3. Thoracic proportions in dorsal view.
4. Presence or absence of humeral spines.
5. Profile of thoracic dorsum in side view.

6. Relative size and shape of propodeal lamellae.
7. Form of petiole in dorsal and lateral views.
8. Presence or absence of lateral postpetiolar wings, and their shape if present.
9. Distribution and density of sculptural foveolae on head and thorax.
10. Distribution and intensity of microsculpture, especially on thorax, petiole and postpetiole.
11. Sculpturation of first gastral tergite.

MEASUREMENTS AND INDICES

Measurements and indices used below are listed here. In the text measurements are given in mm.

Total length (TL): sum of axial lengths of body tagmata, including head and closed mandibles, but not extruded parts of sting.

Head length (HL or HL (max)): maximum measurable full length of head, frontal view, from posteriormost crests of occipital lobes to anteriormost point of clypeal border.

Midline head length (HL (mid)): length of head in viewing position for HL (max), measured along midline, from anterior clypeal border to occipital border.

Head width (HW): maximum width of head, front view, measured across cranium, not including compound eyes, even if these protrude laterally.

Cephalic Index (CI): $HW \times 100/HL$ (max).

Head depth (HD): Maximum measurable depth of head, lateral view, measured through point of greatest depth.

Index of cephalic depression (ICD): $HD \times 100/HL$ (max).

Mandible length (ML): exposed length of closed mandibles, measured from their tips to most anterior point of clypeal border, with head in HL measuring position.

Mandibular index (MI): $ML \times 100/HL$ (max).

Pronotum width (PW): maximum width of pronotum, dorsal view, including humeral spines if they project beyond the general outline.

Weber's length of thorax (WL): maximum diagonal distance, lateral view, from anterior face of pronotum to inferior propodeal angle (*not* inferior angle of propodeal lamella).

Petiolar node width (PNW): maximum width of petiolar node, dorsal view.

Postpetiole width (PpW): maximum width of postpetiole, dorsal view.

KEY TO SPECIES OF *Mesostruma*

(WORKERS)

1. Pronotal humeri, viewed from above, acutely subdentate (Plate 1B) 2
 Pronotal humeri gently rounded in dorsal view (Plate IVB) 3
2. Propodeal lamellae well developed and entire (Plate IC); postpetiole transverse, with broad lamellate lateral wings. (Plate ID) *M. laevigata* Brown
 Propodeal armament on each side consisting of a short blunt posterodorsal tooth and a small inferior propodeal lamella, the two connected at most by a low carina (Plate IIC); postpetiole transverse but sub-globular, with little trace of lateral alary structures (maximally developed as in Plate IID) *M. eccentrica* sp. n.
3. Promesonotal dorsum subopaque, covered entirely by shallow foveolate punctures which are rarely separated by distances exceeding $\frac{2}{3}$ their average diameter of *ca* 0.02-0.025 mm;

interpunctural areas subopaque, with a distinct, regular, granular microsculpture (Plate IIIB); gaster finely longitudinally striate over basal half or more of segment 1 (Plate IIID)

M. turneri (Forel)

- Promesonotal dorsum shining, with scattered foveolae, mostly separated by distances greater than their average diameter and usually absent from a median longitudinal tract of the sclerite; this median strip and other interpunctural surfaces smooth and strongly shining, without regular microsculpture (Plate IVB); segment 1 of gaster smooth and strongly shining .. 4
4. Eyes relatively small (maximum diameter $0.23-0.28 \times$ the maximum interocular distance), and so convex as to be almost hemispherical (Plates VA, VIA); propodeal lamellae with emarginate posterior borders and distinctly acute posterodorsal angles (Plates VC, VIC) .. 5
- Eyes relatively large (maximum diameter about $0.33 \times$ the minimum interocular distance in the 2 specimens available), markedly less than hemispherical in shape (Plate IVA); propodeal lamellae with posterior borders entire, the posterodorsal angles approximately 90 degrees (Plate IVC) *M. loweryi* sp. n.
5. Pronotum width (PW) about $0.66-0.69 \times$ midline length of thoracic dorsum (as measured in dorsal view from apex of pronotal collar to a line spanning the bases of the propodeal lamellae i.e. at the posterior edge of the propodeal dorsum, Plate VB); anterodorsal margins of propodeal lamellae in side view distinctly convex to sinuous (concave apically), emargination of posterior border relatively shallow (Plate VC) *M. browni* Taylor
- PW about $0.58-0.62 \times$ length of thoracic dorsum measured as detailed above (Plate VIB); anterodorsal margin of propodeal lamella in side view approximately straight (usually very feebly concave or convex), emargination of posterior border relatively deep (Plate VIC) .. *M. exolympica* sp. n.

Mesostruma laevigata Brown
(Plate I)

Mesostruma laevigata Brown, 1952, *Trans. R. Soc. S. Aust.* **75**: 12, figs. 1a, 1b, worker, female. Type locality: Sea Lake, Victoria ($35^{\circ} 30'S$, $142^{\circ} 50'E$).

Distribution, material examined

SOUTH AUSTRALIA: 1 km NW of Monash, 3 workers (6.vii.1970, ICT). Monash, 2 workers (6.vii.1970, ICT). VICTORIA: Sea Lake (Type locality) (J. C. Goudie), *holotype*, *gynotype*, 4 labelled *paratype* workers, 22 workers from original collection without paratype labels (one of these is illustrated) and a dealate female and worker with same data as paratypes but on differently executed labels. NEW SOUTH WALES: 14 km W of Balranald, 1 dealate female (9.ii.1970, RWT). All specimens in ANIC.

The South Australian and New South Wales records are from Berlese funnel samples of litter collected at the bases of Mallee-type *Eucalyptus* trees.

Worker diagnosis

Dimensions as follows (N=33): TL *ca* 2.9-4.2; HL (max) 0.66-0.90; HL (mid) 0.63-0.85; HW 0.57-0.82; CI 86-91; HD 0.39-0.54; ICD 57-61; ML 0.26-0.36; MI 39-42; PW 0.37-0.60; WL 0.72-1.05; PNW 0.16-0.25; PpW 0.32-0.60. The material studied by Brown (1952) had CI 85-93 had MI 37-44, the WL maximum was 1.12.

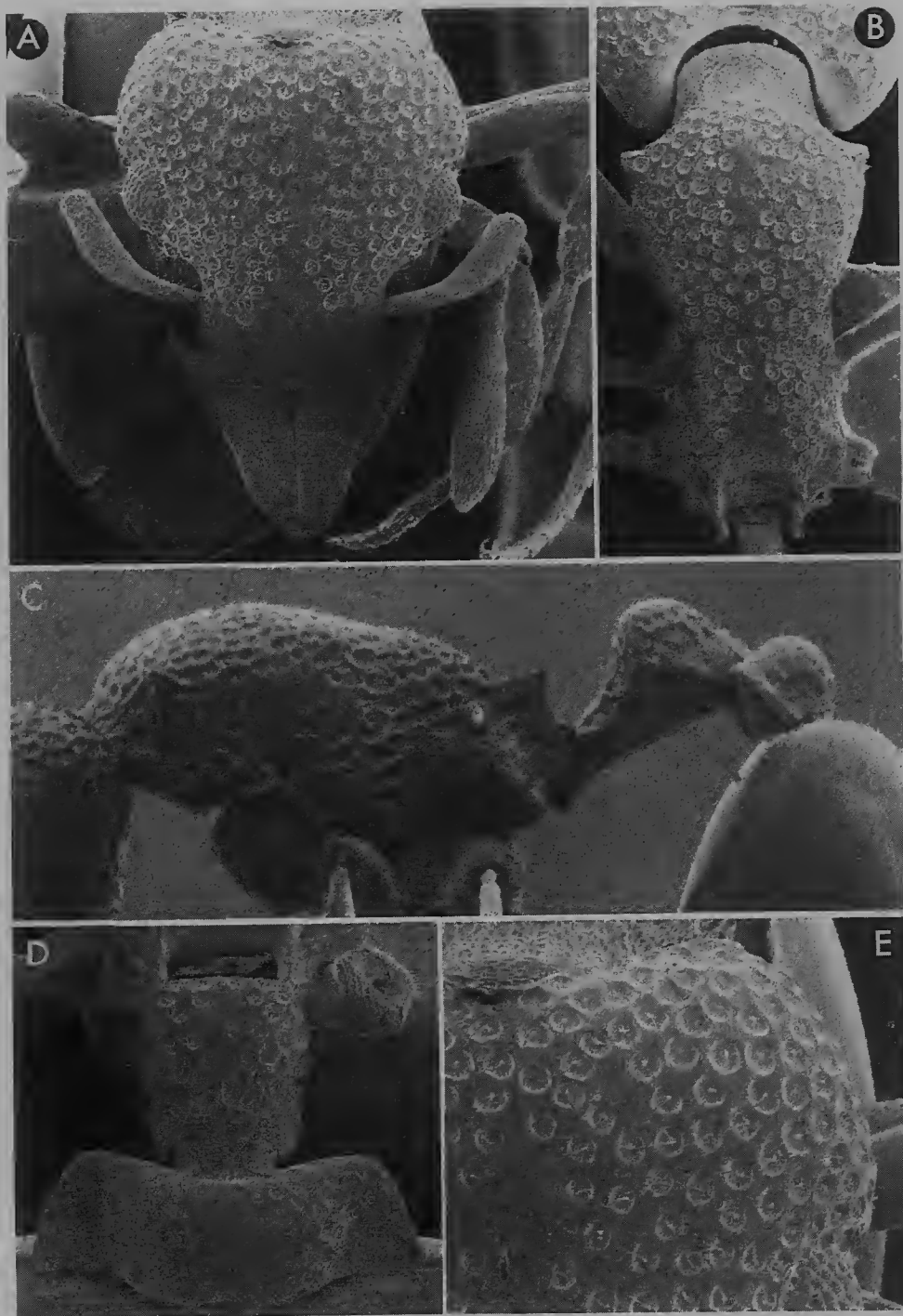


PLATE I

Mesostruma laevigata Brown, worker, Sea Lake Victoria (Type locality), standard views, (A) head, anterior; (B) thorax, dorsal; (C) thorax and nodes, lateral; (D) nodes, dorsal; (E) detail, head, anterior. *Dimensions*: HW 0.82 mm; PW 0.60 mm; WL 1.05 mm; PpW 0.57 mm.

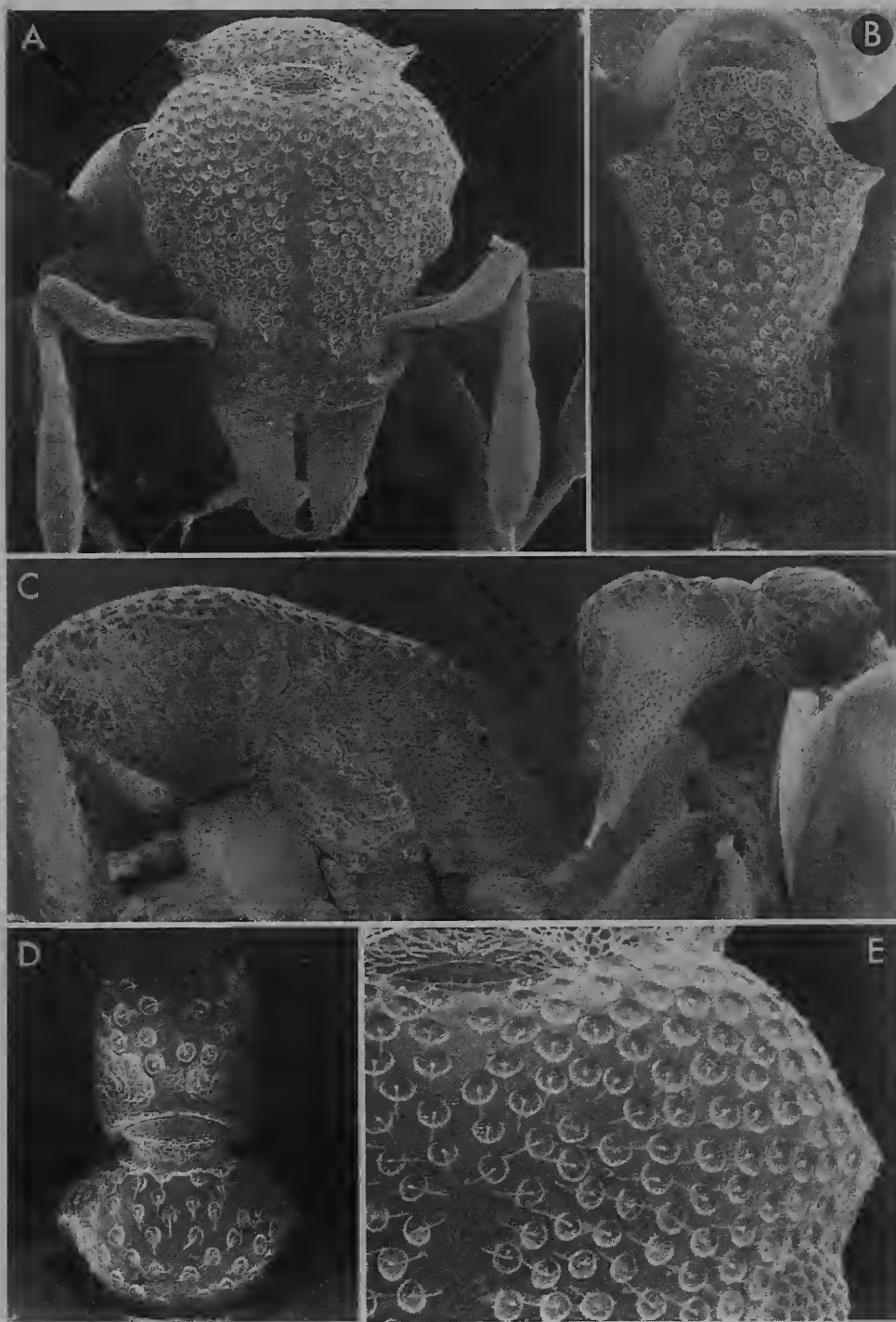


PLATE II

Mesostruma eccentrica sp. n. holotype worker, standard views as in Plate I. See text for dimensions.

Major diagnostic features as in couplets 1 and 2 of the key above. Additional features as follows: Sides of head behind eyes evenly rounded in front view. Interpunctural areas of frons and thoracic dorsum smooth and shining, with a few vague, minute longitudinal striae or rugulae on pronotal disc. Polished granular microsculpture present on pronotal collar, sides, declivity and lamellae of propodeum, sides of trunk behind pronotum, and on petiole and postpetiole (except for their crests and the leading edges of the postpetiolar wings). First gastral tergite smooth and strongly shining. Colour in recently collected specimens generally golden sienna-brown, apparently fading in old material to yellowish-brown; mandibles, antennae, legs and gaster slightly lighter.

Allometric variation in cephalic proportions reported by Brown (1952) has been confirmed in this study. The specimen illustrated is a large one; smaller individuals have proportionately narrow heads.

Female diagnosis

The gynetype, paragynetype (measurements from Brown 1952) and 2 additional females have the following dimensions: TL *ca* 4.7-5.4; HL (max) 0.95-1.00; HW 0.86-0.90; CI 90-93; MI 37-39; WL 1.28-1.36. The worker diagnosis applies except that the pronotum lacks interpunctural microsculpture. Areas near ocelli, thoracic sutures, dorsolateral corners of petiolar node and postpetiolar wings darkly infuscated.

***Mesostruma eccentrica* sp. n.**

(Plate II)

Type locality: 14 km W of Balranald (34°38'S, 143°25'E), New South Wales.

Distribution, material examined

SOUTH AUSTRALIA: Seal Bay, Kangaroo Island, 5 workers (18.v.1970, BBL); Monarto South, 2 workers (23.vii.1969, C. A. Kirkby), dealate female (30.vii.1969, C. A. Kirkby); 3.2 km W of Sherlock, 9 workers (12.i.1970, RWT); 4.8 km W of Parilla, 18 workers (12.i.1970, RWT). 12.8 km SW of Waikerie, 2 workers, dealate female (22.viii.1971, BBL); 1 km NW of Monash, 2 workers, 1 dealate female (17.v.1970, ICT); Monash, 4 workers (6.vii.1970, ICT). **VICTORIA**: Lake Hattah, 1 worker (27.x.1967, E. B. Britton); 27 km S of Ouyen, 1 dealate female (8.ii.1970, CGB); Wyperfeld National Park, 1 km N of Frew's Plain, 1 worker (8.ii.1970, RWT); 27 km W of Manangatang, 1 dealate female (12.i.1970, RWT). **NEW SOUTH WALES**: 14 km W of Balranald (**TYPE LOCALITY**) *holotype*, 44 worker *paratypes* and a dealate female (9.ii.1970, RWT).

Lowery's South Australian specimens were collected foraging on mallee stems in late afternoon or early morning.

Type designations.—Because this species is variable the type series is here restricted to specimens from the type locality only. These alone are designated paratypes. Other specimens carry my identification label dated 17.v.71. The holotype has been gold-palladium coated; a colour matched paratype is mounted on the same pin.

Deposition of material.—All specimens in ANIC (Type no. 7513), except 2 paratypes each in AM, BM(NH), GM, MCZ, NMV, SAM, MNB.

Worker diagnosis

Dimensions of the various series are given in Table 1. Major diagnostic features as in couplets 1 and 2 of the key above. Sides of head behind eyes evenly rounded (as in *M. laevigata*—Plate IA) to broadly angled (Plate IIA). Sculpturation and colour as described above for *M. laevigata*, colour averaging slightly lighter.

Variation.—The specimens vary in size, but this appears to be taxonomically unimportant. Colour also varies; full intensity being developed in only a few specimens from each series. There is slight variation in sculptural density, outline of the sides of the cranium, length of humeral and propodeal spines, length of posterodorsal face of petiolar node in side view, and development of tumosities on the sides of the postpetiole. This variation appears primarily allometric and

several possible geographical correlations are readily explained as perturbations due to distribution of size among the available series. The observed variation in no way influences the diagnosis given above.

Female diagnosis

The smallest and largest of the 6 available females (size ranked on HW) have the following dimensions (these specimens from 1 km N of Monash and 27 km S of Manangatang respectively): TL *ca* 4.2, 4.5; HL 0.84, 0.92; HW 0.80, 0.90; CI 95, 98; MI 38, 34; WL 1.18, 1.25. The worker diagnosis is applicable. Variation largely parallels that of the workers, and is apparently primarily allometric. Colouration generally as in *M. laevigata* female (see above). The female from the paratype series has HW 0.87.

TABLE I
Mesostruma eccentrica sp. n.
RANGES FOR STANDARD DIMENSIONS (mm/100) AND INDICES OF WORKERS
FROM VARIOUS LOCALITIES

Locality *	1	2	3	4	5	6	7	8	9
Number of Specimens	5	2	9	8	2	6	1	1	13
TL	2.9-3.4	3.2,3.4	3.1-3.4	2.8-3.5	3.8,4.0	3.4-4.2	3.0	3.2	3.4-3.8
HL (max)	0.65-0.74	0.70,0.75	0.69-0.74	0.65-0.77	0.84,0.86	0.75-0.90	0.65	0.74	0.75-0.84
HL (mid)	0.62-0.72	0.67,0.72	0.66-0.70	0.62-0.73	0.80,0.80	0.71-0.84	0.61	0.69	0.71-0.79
HW	0.59-0.70	0.65,0.71	0.65-0.69	0.59-0.71	0.80,0.81	0.71-0.85	0.59	0.69	0.70-0.79
CI	91-96	93,95	93-94	90-93	95,94	91-95	91	94	93-95
ML	0.25-0.29	0.27,0.28	0.26-0.29	0.25-0.29	0.32,0.33	0.29-0.34	0.25	0.28	0.27-0.30
MI	38-39	39,37	38-40	38-42	38,38	37-39	39	38	35-38
PW	0.38-0.49	0.46,0.50	0.45-0.49	0.40-0.50	0.59,0.63	0.50-0.63	0.42	0.49	0.50-0.60
WL	0.72-0.90	0.82,0.90	0.81-0.86	0.74-0.94	1.01,1.03	1.90-1.10	0.75	0.86	0.90-1.00
PNW	0.17-0.20	0.19,0.21	0.19-0.20	0.16-0.20	0.24,0.25	0.20-0.27	0.17	0.20	0.20-0.23
PpW	0.22-0.25	0.25,0.28	0.25-0.27	0.22-0.27	0.33,0.32	0.29-0.37	0.24	0.28	0.28-0.33

* Localities:— (1) Seal Bay; (2) Monarto South; (3) W of Sherlock; (4) W of Parilla; (5) SW of Waikerie; (6) Monash area; (7) Lake Hattah; (8) Wyperfeld Nat. Park; (9) 14 km. W of Balranald (Type series)

Mesostruma turneri (Forel) (Plate III)

Strumigenys (*Epopostruma*) *turneri* Forel, 1895, *Annls Soc. ent. Belg.* **39**: 424 worker. Type locality: Mackay, Queensland.

Epopostruma turneri: Emery, 1922, *Genera Insect.* **174**: 330.

Mesostruma turneri: Brown, 1948, *Trans. Am. ent. Soc.* **74**: 119; 1952, *Trans. R. Soc. S. Aust.* **75**: 11.

Distribution, material examined

QUEENSLAND: Mackay (21°09'S, 149°12'E) (May 1894, Gilbert Turner). Known only from the original collection. Brown (1952) discussed two "cotype" (in fact syntype) specimens. I have studied four additional syntype workers (ANIC); one of these is illustrated.

Worker diagnosis

Dimensions as follows (N=6 for measurements given also by Brown (1952), 4 for remainder): TL *ca* 3.0-4.0; HL (max) 0.75-0.86; HL (mid) 0.68-0.77; HW 0.72-0.89; CI 96-103; HD 0.52-0.62; ICD 67-71; ML 0.32-0.38; MI 43-45; PW 0.47-0.57; WL 0.81-0.96; PNW 0.22-0.26; PpW 0.53-0.65.

Diagnostic features as in couplets 1 and 3 of the key to species given above. Further characterisation is unnecessary.

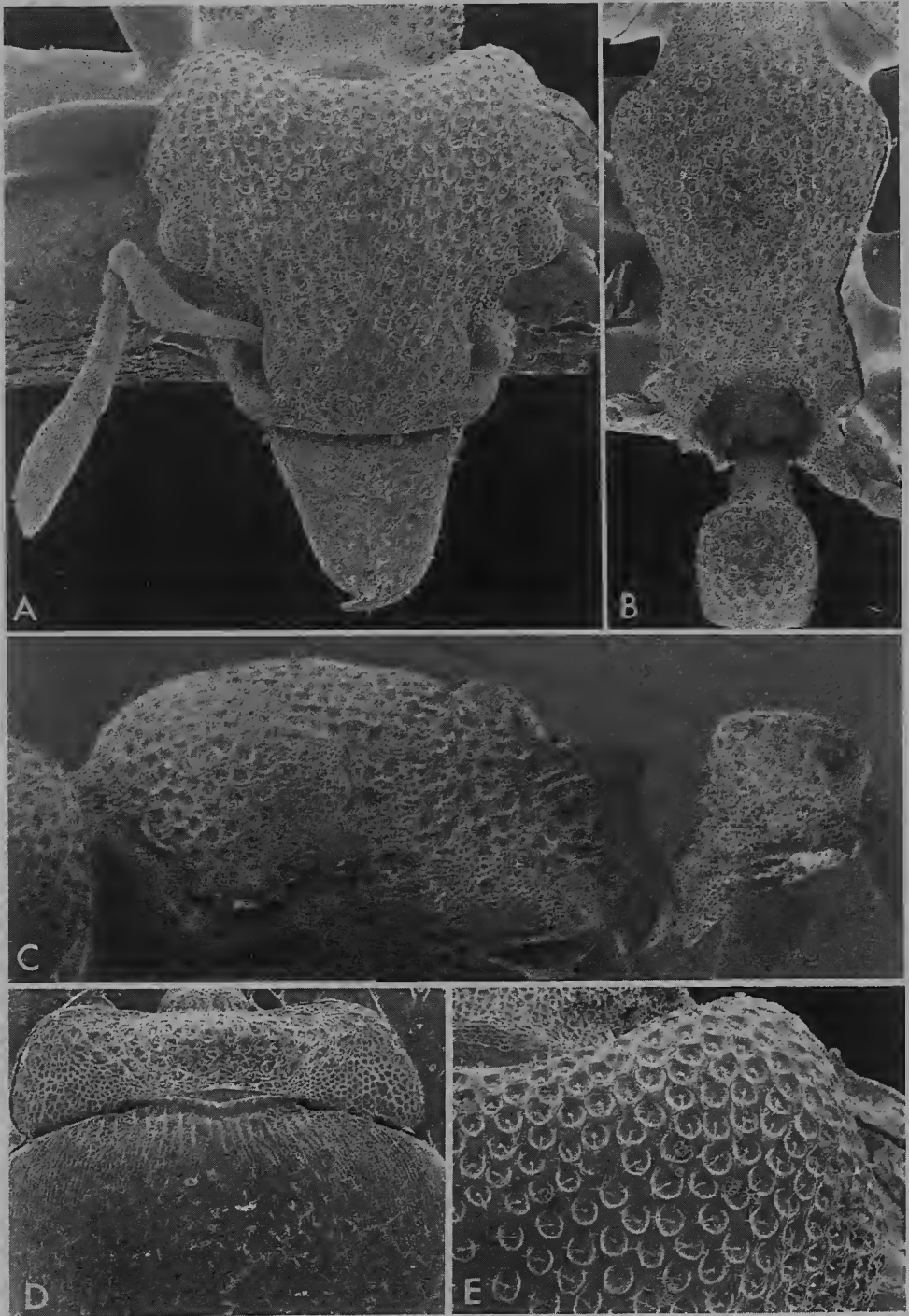


PLATE III

Mesostruma turneri (Forel), syntype worker, (A) head, anterior; (B) thorax and petiole, dorsal; (C) thorax and petiole, lateral; (D) postpetiole and gaster, dorsal; (E) detail, head, anterior. *Dimensions*: HW 0.89 mm; PW 0.57 mm; WL 0.93 mm; PpW 0.64 mm.

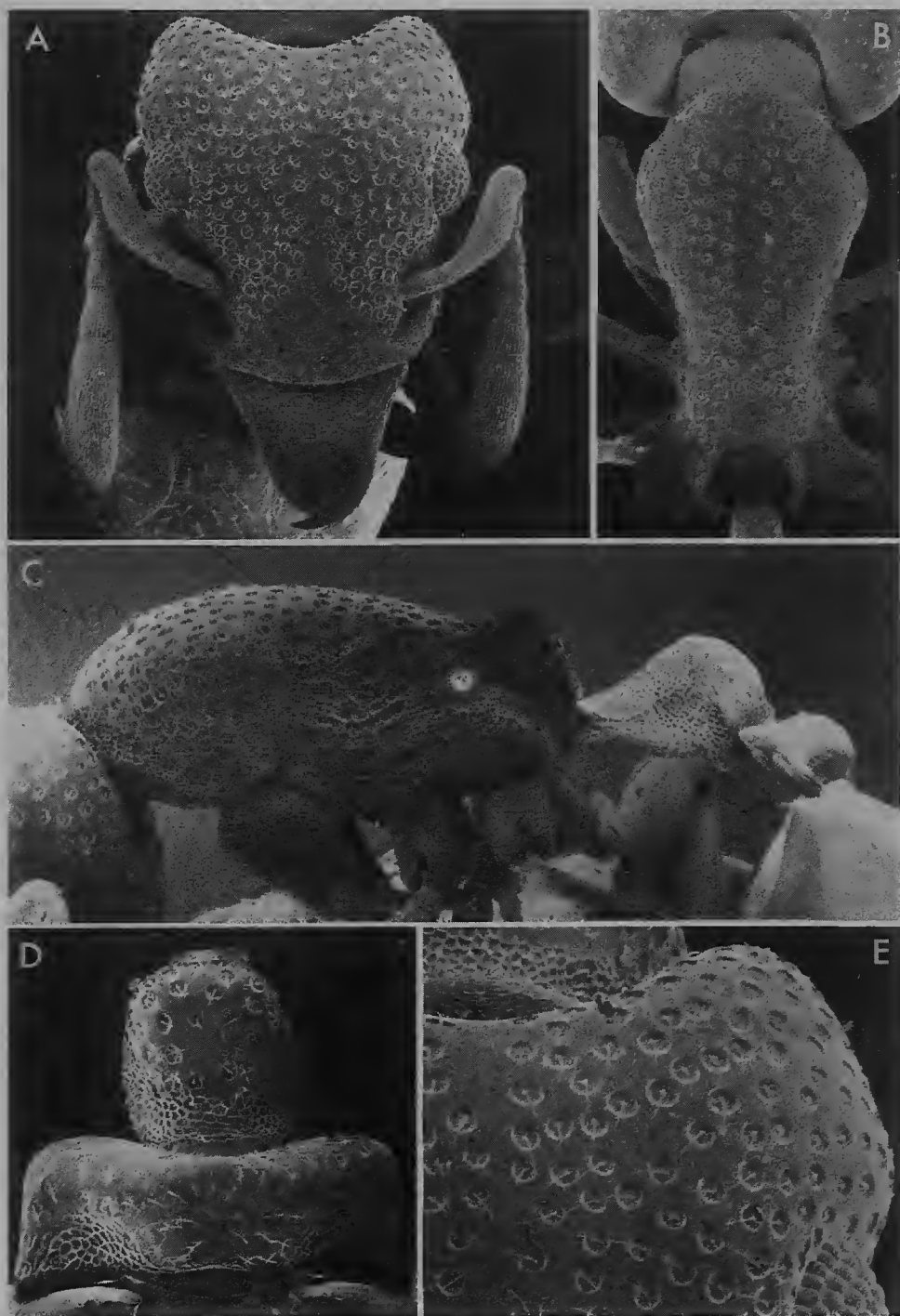


PLATE IV

Mesostruma loweryi sp. n. holotype worker, standard views as in Plate I. See text for dimensions.

***Mesostruma loweryi* sp. n.**
(Plate IV)

Type locality.—Willaston (34°35'S, 138°45'E), near Gawler, South Australia.

Distribution, material examined

Only two workers are known, here designated *holotype* and *paratype*, deposited in ANIC (Type no. 7514). They were collected together from moss-covered soil in dry sclerophyll woodland (viii.1969, BBL). The holotype, which is illustrated here, has been gold-palladium coated. The uncoated paratype is mounted on the same pin. The specimens were originally similar in colouration.

Worker diagnosis

Dimensions as follows (holotype cited first): TL *ca* 3·6, 3·6; HL (max) 0·82, 0·83; HL (mid) 0·73, 0·73; HW 0·71, 0·72; CI 87, 87; HD 0·52, 0·54; ICD 63, 65; ML 0·31, 0·32; MI 38, 39; PW 0·47, 0·48; WL 0·90, 0·91; PNW 0·21, 0·21; PpW 0·47-0·48.

Major diagnostic features as in key couplets 1, 3 and 4 above. Characterisation additional to that provided by Plate IV and the above dimensions is unnecessary. Colour dull sienna-brown; mandibles, antennae, legs, propodeal lamellae and postpetiolar wings a shade lighter; the following areas darkly infuscated: "ocellar" area of frons, most of petiole, body of postpetiole and margins of gastral dorsum. Variation in the specimens is negligible.

***Mesostruma browni* Taylor**
(Plate V)

Mesostruma browni Taylor, 1962, *Breviora* 152: 1, Figs 1-5, worker, female, male. Type locality: 2 miles (3·2 km) E of Berry, New South Wales (34° 47'S, 150° 40'E).

Distribution, material examined

NEW SOUTH WALES: *Holotype* and 22 *nidoparatype* and *paratype* workers from most original localities (see Taylor, 1962): Barrington Tops; Riverview College, Sydney; 2 miles E of Berry (TYPE LOCALITY); a dealate female *paratype* from Pymble, Sydney. Ettalong Lookout, 4 workers, Berlese funnel sample, dry sclerophyll on sandstone (28.vi.1968, M. S. Upton and L. R. Mound). All ANIC. An Ettalong Lookout specimen is illustrated.

Worker diagnosis

Ranges of dimensions for all material as in original description (holotype cited first): TL *ca* 3·6, 3·1-3·9; HL 0·78, 0·69-0·83; HW 0·71, 0·62-0·74; CI 91, 89-96; ML 0·37, 0·32-0·38; MI 47, 42-49; WL 0·84, 0·74-0·92. The holotype has the following additional measurements HL (mid) 0·73; HD 0·55; ICD 71; PW 0·49; PNW 0·25; PpW 0·54.

Major diagnostic features as detailed in key couplets 1, 3, 4, and 5. Further characterisation is unnecessary.

Male and Female diagnoses

See original description.

***Mesostruma exolympica* sp. n.**
(Plate VI)

Type locality.—Mt. Ainslie, (35°16'S, 149°10'E) Australian Capital Territory (ACT).

Distribution, material examined

AUSTRALIAN CAPITAL TERRITORY: Black Mountain, six series

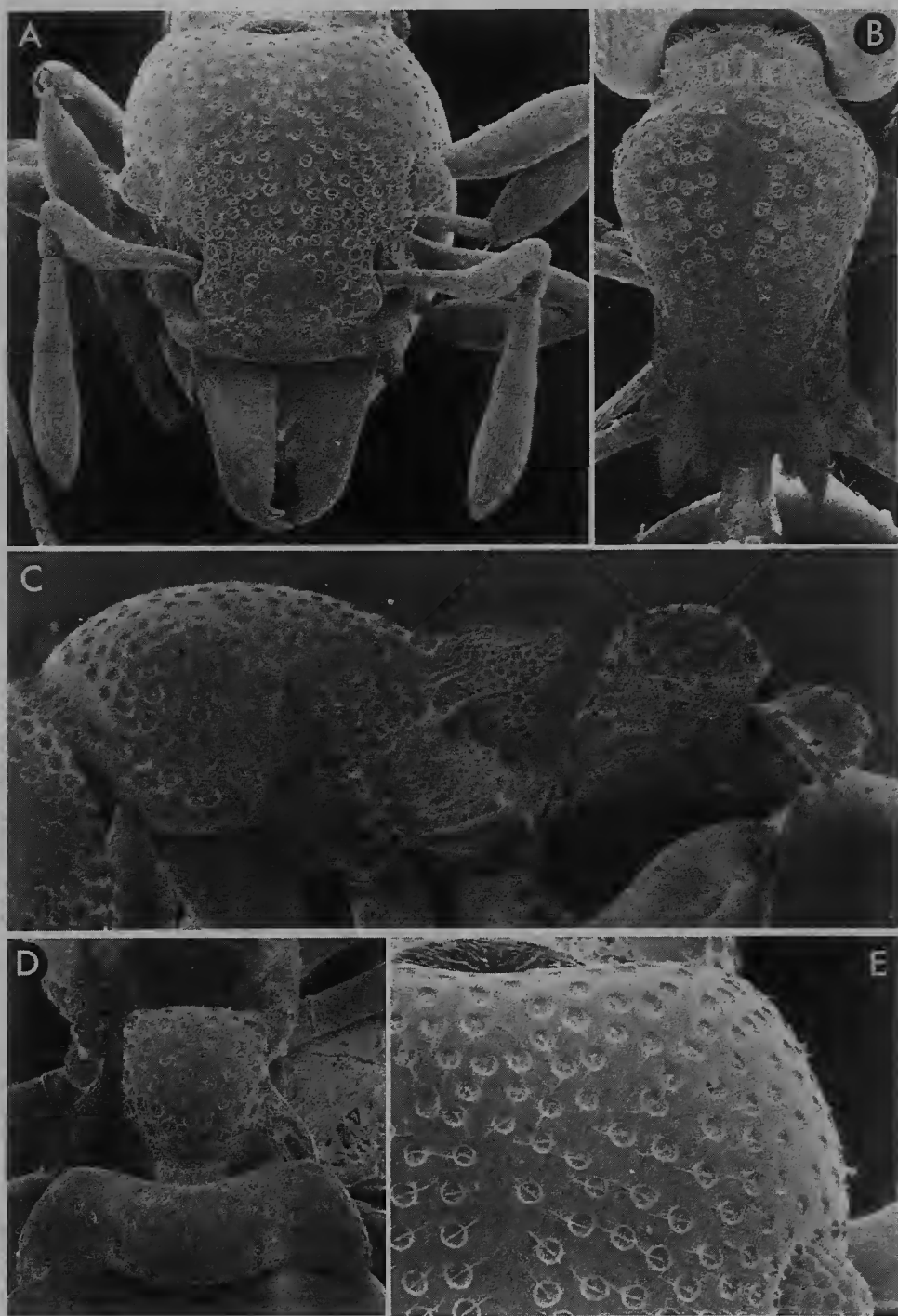


PLATE V

Mesostruma browni Taylor, worker, Ettalong Lookout, N.S.W., standard views as in Plate I. Dimensions: HW 0.68 mm; PW 0.49 mm; WL 0.83 mm; PpW 0.54 mm.

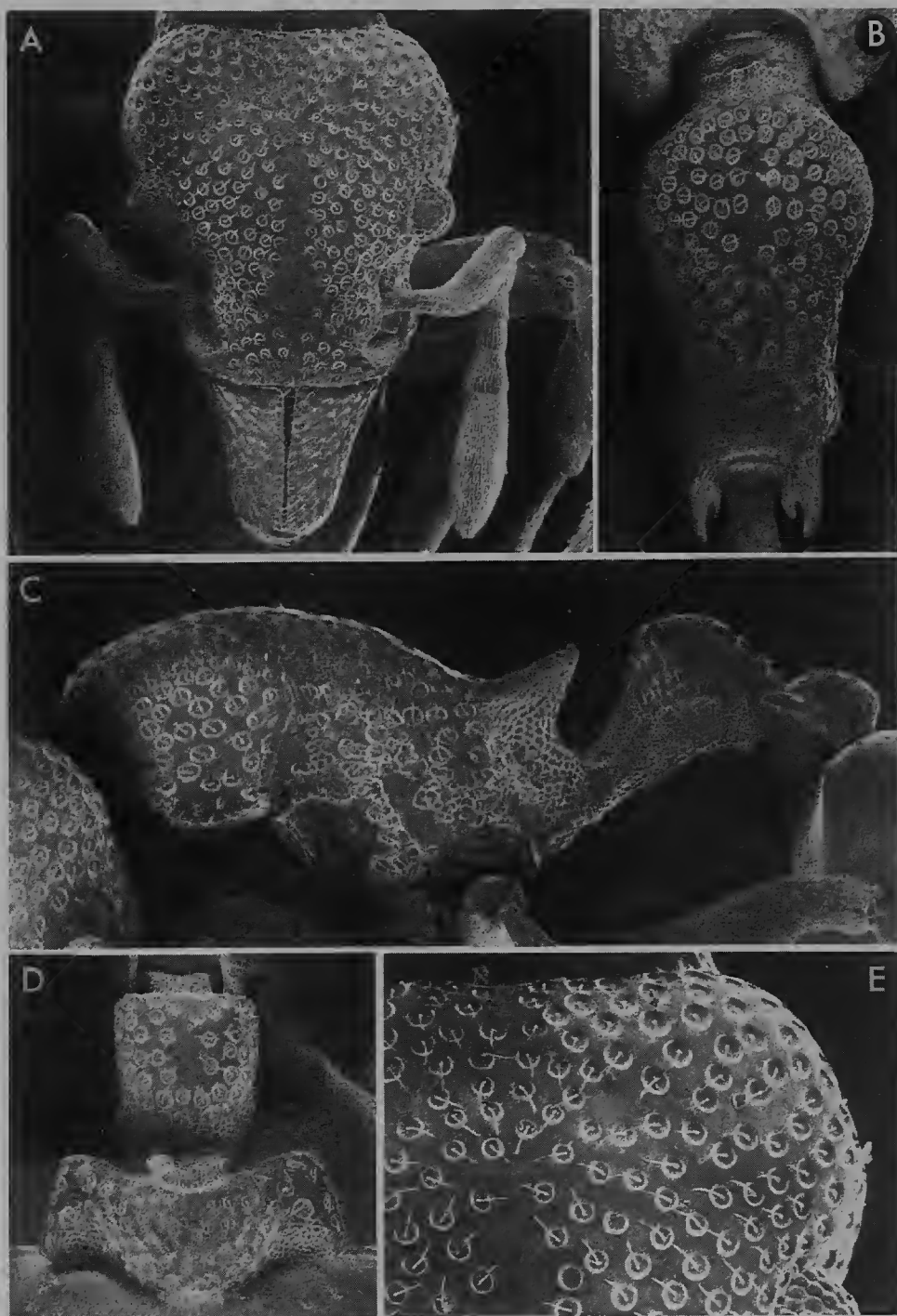


PLATE VI

Mesostruma exolympica sp. n. holotype worker, standard views as in Plate I. See text for dimensions.

including *ca* 85 workers and 3 dealate females from Berlese funnel samples of leaf litter from dry sclerophyll forest (the females all from a single sample). Specific localities include "Caswell Drive" and "W/face", elevations between 570 m and 620 m, dates of collection between 29.xii.1966 and 8.vii.1970 (CGB, JMS, ICT, RWT); Brindabella Range, *ca* 0.5 km NE of Cotter Dam, Berlese funnel sample, dry sclerophyll forest, *ca* 570 m, 13 workers (27.i.1970, RWT & CGB); Mt. Ainslie (TYPE LOCALITY) colony under rock, dry sclerophyll forest, 31 workers, larvae and pupae (16.xii.1966, BBL). SOUTH AUSTRALIA: Echunga, dealate female, under rock, dry sclerophyll (4.v.1969, BBL); Long Gully National Park, Mt. Lofty Ranges, 3 workers from tree trunks, dry sclerophyll forest (14.ix.1971, 18.ix.1971, BBL).

Type designations.—Formal paratype designation is here restricted to material from the Australian Capital Territory, specifically excluding South Australian specimens.

Type depositions.—*Holotype* and most *paratypes* (including females) in ANIC (Type no. 7514), *paratype* workers in AM, BM(NH), GM, MCZ, NMV, SAM, MNB. South Australian specimens in ANIC and SAM.

Worker Diagnosis

Dimensions as follows (holotype cited first, followed by ACT paratypes (N=68), then South Australian specimens (N=3)): TL *ca* 4.1, 3.3-4.2, 4.1-4.2; HL (max) 0.82, 0.70-0.86, 0.81-0.84; HL (mid) 0.78, 0.68-0.82, 0.77-0.80; HW 0.75, 0.65-0.82, 0.76-0.79; CI 95, 92-96, 94; HD 0.54, 0.45-0.57, 0.53-0.55; ICD 66, 64-69, 65-67; ML 0.35, 0.30-0.35, 0.33-0.35; MI 43, 41-46, 41-42; PW 0.55, 0.44-0.58, 0.56-0.57; WL 0.95, 0.79-1.00, 0.96-0.99; PNW 0.23, 0.18-0.25, 0.24-0.26; PpW 0.50, 0.42-0.53, 0.49-0.51.

Major diagnostic features as above in key couplets 1, 3, 4 and 5. Colour golden sienna-brown, mandibles, antennae, legs and propodeal lamellae a shade lighter, larger specimens sometimes with dark infuscation on "ocellar" area of frons. Some fading is already evident in older specimens.

Variation is slight, smaller specimens have proportionately narrow heads and give lower values for CI, their crania are less deeply excavated behind than in large specimens. ACT and South Australian specimens of comparable size are virtually identical, except that the latter all have darkly infuscated "ocellar" areas.

Female diagnosis

Dimensions as follows (ACT specimens listed first (N=3) then South Australian specimen: TL *ca* 4.4-4.6, 4.3; HL 0.86-0.90, 0.84; HW 0.83-0.86, 0.80; CI 95-97, 95; ML 0.34-0.35, 0.34; MI 39-40, 40; WL 1.20-1.26, 1.18; PNW 0.29-0.32, 0.32; PpW 0.57-0.60, 0.59. General features in accord with workers, no apparently significant variation. Colour as in workers, areas near ocelli, thoracic sutures and postpetiole darkly infuscated, gaster dark reddish brown.

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